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Abstract

BIOLOGICAL DISPOSITION OF ANTI-BILHARZIAL ANTIMONY DRUGS PART I. ESTIMATION OF ANTIMONY IN BODY FLUIDS BY ACTIVATION ANALYSIS

A.A. Abdel-Rassoul and M.F. Abdel-Wahab
(U.A.R. Atomic Energy Establishment, Inshass, Egypt)
A.R. Schulert, H.G. Browne and M.M. Mansour
(U.S. Naval Medical Research Unit No.3, Cairo, Egypt)

Neutron activation analysis is applied for the determination of antimony in body fluids. This method is used for following the disposition of anti-Bilharzial antimony drugs in biological samples. It consists of simultaneous irradiation of a standard and test sample in the Inshass 2MW Research Reactor (1.3×10^{13} $n/cm^2 sec.$), followed by dissolution and addition of Sb-carrier. In a single step, antimony is separated as the volatile hydride SbH_3, decomposed and dissolved in H_2SO_4 before counting. The chemical yield is determined spectrophotometrically. The procedure is used for routine analysis of various samples with good reproducibility, and gives adequate decontamination of antimony from foreign activities. Independently comparative assays were performed in some samples which were already tagged to a slight degree with antimony-124, and the methods were found to be consistent. Measurements under the conditions specified can assay levels of about 0.01 ppm antimony in biological ash of plasma and red blood cell samples of treated patients with an accuracy within $\pm 10\%$. The disposition of antimony drugs in man has been studied by the use of Sb-124 labelled material. Neutron activation analysis represents an alternative with the following advantages: (1) the method is 10-100 times more sensitive than the radioactive assay when the radiation dose to the patient is within acceptable limits, (2) the assay is accomplished with no radiation whatsoever to the patient, and (3) the necessity of specially prepared labelled material is avoided.

Results will be reported for biological fluids and excreted ova from patients. Data will also be presented on the disposition of antimonial compounds which were not readily available in labelled form.